

Methylmercury Results

1st MeHg data

In addition to testing 2 biological replicates of *E.coli* and *Pseudomonas* strains carrying the *pBBRBB::mer* plasmid, strains containing the *pBBRBB::gfp* within encapsulation beads were tested as a negative control within encapsulation beads. LB (abiotic) as well as LB (abiotic) containing 0.5g encapsulation beads were also used as negative controls. Unencapsulated bacteria of each strain were also tested to compare the efficiency of those cells in direct contact with MeHg to those within the encapsulation beads.

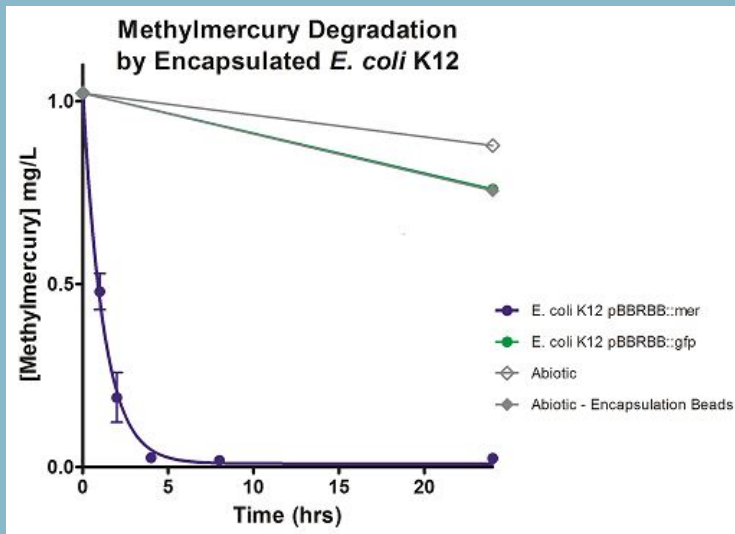


Figure: Methylmercury degradation over time by Encapsulated *E.coli* with *mer* operon and empty vector control. Abiotic beads tested to measure MeHg uptake from silica matrix. Abiotic LB tested to measure MeHg uptake by media.

Experiments were conducted by adding methylmercury chloride to 7 mL of LB at a final concentration of 1 mg/L. The methylmercury levels were analyzed at the start of the experiment and after 36 hours. At each time point the samples were diluted a million-fold before taking measurements with a Tekran model 2700 Automated Methyl Mercury Analyzer using EPA method 1630 without distillation. This is a highly sensitive and ultra-stable cold vapor atomic fluorescence spectrometry (CVAFS) Hg detector. All quality assurance and quality control measures were taken as outlined in EPA method 1630. All MeHg standards (ongoing precision recoveries) were within the acceptable range averaging 96%.

The samples showed growth of both encapsulated and unencapsulated *E. coli* and *Pseudomonas* carrying *pBBRBB::mer* after 36 hours, and complete demethylation of the 1mg MeHg in both the encapsulated and unencapsulated samples. No cell growth was observed in strains containing the *pBBRBB::gfp* negative control, LB (abiotic) or LB (abiotic) containing 0.5g empty encapsulation beads, and methylmercury levels remained relatively unchanged. This preliminary run showed that methylmercury levels could drop to undetectable levels in the presence of our bacteria (both *E.coli* and *Pseudomonas*) but not in their absence.